PATENT CLAIMS

1. An apparatus comprising electronic and/or optoelectronic circuitry for implementing electronic and/or optical functions, wherein the circuitry is realized and/or integrated in two or more dimensions, characterized in that the circuitry comprises elements in the form of wires, fibres, ribbons, strips, or multicomponent filaments and/or combinations thereof, said elements interfacing in a predetermined pattern such that said circuitry are realized with intersections in physical or near physical contact between the elements thereof, that said predetermined pattern is generated by integrating physically two or more of said elements in a fabric-like structure by any of the following processes, viz. weaving, knitting, crocheting, knotting, stitching and/or combinations thereof, that said elements include transparent, non-transparent, conducting, semiconducting or isolating materials and/or combinations thereof, that at least some of said elements according to their material properties form electrical or optical transmission lines or isolators in said circuitry, said electrical or optical transmission lines conveying respectively electrical or optical energy between points and/or areas in said fabric-like structure, that at least some of said elements comprise spatially defined extended active regions, and that at least some of said elements in portions of said fabric-like structure are adapted for emitting or absorbing electrical, chemical, mechanical or optical energy or by interacting with each other by an exchange of energy of the aforementioned kinds.

2. An apparatus according to claim 1, characterized in that the elements are provided in the predetermined pattern forming a substantially two-dimensional fabric-like structure.

3. An apparatus according to claim 1, characterized in that the elements are provided in the predetermined pattern forming a substantially three-dimensional fabric-like structure.

4. An apparatus according to claim 3, characterized in that the elements each has a length and are provided in a spatial distribution such that the positions of the end-points of the elements in the fabric-like structure define a spatial pattern or grid.

5. An apparatus according to claim 1, characterized in that some of the transmission lines are twisted pairs.

6. An apparatus according to claim 1, characterized in that some of the transmission lines are coaxial cables.

7. An apparatus according to claim 1, characterized in that some of the transmission lines are striplines.

8. An apparatus according to claim 1, characterized in that some of the transmission lines are optical fibres.

9. An apparatus according to claim 1, characterized in that the active regions of the elements are defined by exposing portions of the elements to the exterior surroundings thereof.

10. An apparatus according to claim 1, characterized in that active regions of an element are lengthwise extended therein.

11. An apparatus according to claim 1, characterized in that an active region of an element corresponds to an end-point thereof.

12. An apparatus according to claim 1, characterized in that some of the elements are provided with a protective shielding or cladding, the active regions in these elements being provided by removing the shielding or cladding at selected portions thereof.

13. An apparatus according to claim 1, characterized in that the active regions of the elements are provided in selected portions of the elements exposed in the surface of the fabric-like structure or protruding therefrom at selected locations thereof.

14. An apparatus according to claim 1, characterized in that the active regions of the elements are defined by exposing portions thereof to spatially selective physical or chemical influences.

15. An apparatus according to claim 14, characterized in that some of the transmission lines are at least one conductor embedded in an exterior cladding comprising at least one organic semiconducting material, and that active regions are defined therein by contacting said transmission lines with other transmission lines of the same kind or with other transmission lines in intersections which comprise at least one non-isolated or unclad conductor

only, whereby semiconducting junctions are formed at the contact points of said intersections.

16. An apparatus according to claim 15, characterized in that the semiconducting junctions are formed spontaneously upon contacting.

17. An apparatus according to claim 15, characterized in that at least one of the semiconducting junctions are a diode junction.

18. An apparatus according to claim 15, characterized in that the organic semiconducting material is a semiconducting conjugated or non-conjugated polymer.

19. An apparatus according to claim 1, characterized in that at least some of the elements over some of their length are shielded against any interactions in form of an exchange of energy between each other or the exterior surroundings, whereas one or more unshielded portions thereof are adapted for interactions of this kind.

20. An apparatus according to claim 19, characterized in that the unshielded portions of the elements are located at the intersections thereof.

21. An apparatus according to claim 1, characterized in that an apparatus is a two- or three-dimensional optoelectronic display.

22. An apparatus according to claim 21, characterized in that the elements are signal transmission lines.

23. An apparatus according to claim 21, wherein the display is a two-dimensional display, characterized in that the elements are provided in a two-dimensional array.

24. An apparatus according to claim 23, characterized in that the elements intersect in a substantially regular pattern or grid, said elements at the intersections thereof being adapted for absorbing or emitting electrical or optical energy.

25. An apparatus according to claim 24, characterized in that a portion of at least one element in an intersection is a pixel of the display.

26. An apparatus according to claim 21, wherein the display is a three-dimensional display, characterized in that the elements are provided in a three-dimensional array.

27. An apparatus according to claim 26, characterized in that the elements intersect in a spatial regular pattern or grid, said elements in intersections thereof being adapted for emitting or absorbing electrical or optical energy.

28. An apparatus according to claim 26, characterized in that a portion of at least one element in an intersection is a pixel of the display.

29. An apparatus according to claim 26, wherein active regions of the elements are provided in selected portions of the element exposed in the surface of the fabric-like structure or protruding therefrom at selected locations thereof, characterized in that active regions of this kind are pixels in the display, said active regions being either a loop-like portion of an element or an end-point thereof.

30. An apparatus according to claim 1, characterized in that an apparatus comprises respectively one or more discrete electronic, optoelectronic or optical devices or combinations thereof.

31. An apparatus according to claim 30, characterized in that one or more of the discrete devices are physical or chemical sensors connected to at least one of the elements.

32. An apparatus according to claim 1, characterized in that one or more of the elements are a physical or chemical sensor.

33. A method for realizing and/or integrating circuitry in two- or more dimensions, wherein the circuitry comprises elements in the form of wires, fibres, ribbons, strips or multicomponent filaments and/or combinations thereof, wherein said circuitry is electronic and/or optoelectronic circuitry for implementing electronic and/or optical functions in an apparatus comprising circuitry of this kind, characterized by joining two or more elements into a fabric-like structure by any of the following processes viz. weaving, knitting, crocheting, knotting, stitching and/or combinations thereof, such that the elements interface in a predetermined pattern, whereby the circuitry is realized with the elements intersecting in physical or near-physical contact in the fabric-like structure, said elements being made of transparent,

non-transparent conducting, semiconducting or isolating materials and/or combinations thereof.

34. A method according to claim 33, characterized by providing the surface of the elements with a shielding or cladding material before joining into the fabric-like structure, and by removing said shielding or cladding material after the joining into the fabric-like structure from some elements or from selected portions thereof at selected locations in the fabric-like structure.

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